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CLOUD PATTERNS:
An Operational Hierarchy?

A Monograph
By
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Infantry

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ABSTRACT

This monograph examines the dynamic relationships between the strategic, operational, and tactical levels. Current Army doctrine in FM 100-5, *Operations* depicts the relationships of the levels with a vertical hierarchy, defining the operational level as the "vital link" between tactics and strategy. Army advocates of Alvin Toffler's Third Wave argue that this representation for the levels of war has changed to a non-linear pattern due to technologies released by Information Age forces. This monograph reviews the theories of Jomini and Clausewitz and surveys two battles, Rossbach and Austerlitz, to determine whether the non-linear relationships existed between the levels of war during the Agrarian Age . It further evaluates two tactical events in the Industrial Age, Koniggratz and the Doolittle Raid, and assesses the military command structure of that period to probe the existence of a direct relationship between strategy and tactics. The monograph concludes that the dynamic coupling of strategy and tactics was not born in the Information Age, and that the vertical hierarchy resulted from military command requirements.

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SECTION ONE
Introduction

As the Army prepares for warfare in the next century, advocates of Alvin Toffler's Third Wave theory argue that the vertical hierarchical organization of the levels of war have been changed by new technologies. Figure #1 depicts the vertical hierarchy, which reflects the concept that the operational level serves as the "vital link" between tactics and strategy. Toffler's advocates believe that the tactical level directly links to the strategic level as a result of the introduction and wide spread use of the microprocessor. Figure #2 represents this connection
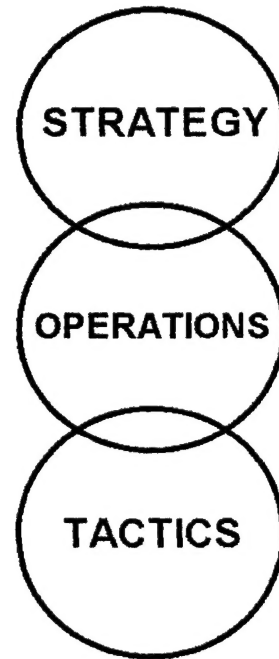
Figure 1
HIERARCHIAL PATTERN

between the strategic and tactical level. Primarily, these advocates suggest this phenomenon results from mass media and data processing systems that allow virtually instantaneous information flow.[1] Their advocacy essentially results from the themes introduced by Alvin Toffler in his books, *The Third Wave* and *War and Anti-War*.[2]

Figure 2
NON-LINEAR PATTERN

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Their discussions shape the Army's preparation for winning future battles, but they overlook an important aspect of this debate.

Has the Information Age really produced a unique phenomenon? Have the levels of war historically remained in a hierarchial pattern in application? This monograph proposes that the strategic, operational, and tactical levels have always been interconnected, and practical requirements such as military command placed them in a vertical hierarchy.

Toffler's advocates suggest that the traditionally accepted view of society and man's environment undergo significant change due to the forces released by Third Wave technology. These adherents believe Toffler's theory that civilization is divided into three waves - an agricultural, an industrial, and an informational. each of these developments fundamentally changed the way people lived and interacted. For example, prior to his First Agricultural Wave, man lived in small, semi-migratory groups which foraged, hunted or fished for food. As the Agricultural Wave swept through these groups, man changed his way of life and began to settle in small villages surrounded by cultivated land. During the Second Wave, industrial forces transformed these small villages into larger cities to meet the pressures of manufacturing and the demands of mass production.[3] Toffler and his Army advocates believe society entered a Third Wave with the invention of the microchip. This invention allows the instantaneous transfer of information and data anywhere in the world. Third Wave social structure according to Toffler will be characterized by "knowledge seeking" with information as the basis for societal

interaction. These Third Wave proponents point out that the microchip caused the world to enter the unique experience of the Information Age.[4]

The development of transportation illustrates Toffler's themes. During the Agrarian or First Wave, man's principal mode of travel were his own feet or an animal's. The Industrial or Second Wave changed this reliance when man invented and produced machines - first steam, then gasoline powered - to replace animal power. Presently, these machines have been upgraded with microprocessors. For instance, the automobile, a chief innovation of the Industrial Age, owes its continued advancement to a computer chip nerve center that flawlessly, efficiently, and simultaneously executes numerous functions to insure its smooth operation. It is this introduction of the microprocessor that Toffler considers the catalyst for his Third Wave.

Toffler's "wave" forces that changed society in th Agararian and industrial Ages would also change the relationships between strategy, operations and tactics as defined by the Army's FM 100-5, **Operations**. His advocates perceive a direct realtionship between the strategic and tactical levels as a result of Information Age forces. They argue that Information Age forces have altered the hierarchial pattern of strategy, operations and tactics as defined in the 1993 edition of the Army's FM 100-5, **Operations**. This manual defines these echelons as starting with *Strategy* and running through *Operations* to *Tactics*.[5] The manual places *Strategy* at the highest level, which is defined as *the art and science of employing the armed forces and other elements of national power during peace, conflict, and war to*

secure national security objectives.[6] The manual further explains *Strategy* as efforts to obtain alliance or coalition objectives.[7] FM 100-5 then sets *Operations* beneath the *Strategic* level as the "vital link between strategic objectives and the tactical employment of forces."[8] The manual delineates the *Operational* level with the following passage:

> At the operational level of war, joint and combined operational forces within a theater of operations perform subordinate campaigns and major operations and plan, conduct, and sustain to accomplish the strategic objectives of the unified commander or higher military authority.[9]

At the lowest echelon lies the *Tactical* level. This level concerns the employment of forces to win engagements and battles and thereby achieve *Operational* objectives.[10] Clearly, FM 100-5 delineates the echelons of the levels of war in a hierarchial pattern as depicted in Figure #1. The manual explains any linkage between *Strategy* and *Tactics* as occurring through a "vital link" at the *Operational* level.

The Third Wave automobile, previously used to explain Toffler's themes, furnishes a means to analyze the significance of understanding the relationships between the three levels of warfare. First, the tactical level of war is considered as the numerous, minute functions that allow the engine to start, the wheels to roll, the brakes to stop, or the steering to turn. These functions such as fuel injection or spark plugs firing represent engagements and battles. Next, the automobile's systems represent the operational level of war. Similar to war's operational level which connect engagements and battles into campaigns; the cooling system, fuel

system, electrical system, and exhaust system groups dozens of minute functions

into a single, complex effect. Lastly, the strategic level is the automobile running

on a road with all of its systems smoothly operating through their thousands of

minute functions. With this analogy in mind, the Army officer is the automobile

owner and driver. Similar to the driver knowing the multiple steps involved in

effortlessly operating his automobile, the military officer must grasp the

relationships between the levels in order to engineer successful combat operations.

SECTION TWO

The Agrarian Age - Toffler's First Wave

The levels of war were first defined for the late Agrarian Age, or Toffler's First Wave, by two veterans of the Napoleonic wars, Antoine-Henri Jomini (1779-1869) and Carl von Clausewitz (1780-1831). While the names for strategy, operations and tactics have been modified over time, the elements within the three levels have remained relatively constant with most of these theorists' fundamental concepts adopted into modern American military doctrine. The problem that arises is the misinterpretation of the theorists' ideas of the relationships and inter-connections between strategy, operations, and tactics. This misunderstanding occurred because of the complexity of the subject and style of the writers. Jomini and Clausewitz wrote about war on both a theoretical and realistic level. Over the years, interpretations of their writings have blended these two levels. While translations to English cause controversy with these difficult concepts, their style additionally leaves room for confusion. Jomini's writings are didactic and prescriptive in marked contrast to Clausewitz' metaphysical and philosophical technique. These styles cause many to believe they held opposite opinions when in fact they shared similar meanings only different approaches.[11] Basically, the foundations they laid in the early 19th century for the relationships between strategy, operations and tactics are open to misinterpretation based on the reader's theoretical and practical experience. In fact, the theories of Jomini and Clausewitz lend themselves to both

the hierarchial and non-linear patterns for describing the relationships between the levels are presented. Reviewing their definitions serves to illustrate the confusion that can arise from Jomini's and Clausewitz' theories.

To remain on firm doctrinal ground, a common description of the levels of war must be understood. FM 100-5 presents the levels of war as strategic, operational, and tactical. Jomini depicted the levels as strategy, grand tactics and tactics, while Clausewitz delineated the levels as war, strategy and tactics. The following matrix, while not in any sequence, simplifies this comparison:

FM 100-5	**Clausewitz**	**Jomini**
Strategy	War	Strategy
Operations	Strategy	Strategy/Grand Tactics
Tactics	Tactics	Tactics[12]

Both theorists defined strategic elements and links to the operational level that remain current in military doctrine. Although Jomini regarded *The Art of War* as a strategic guide, he concentrated more on our present day operational and tactical levels to the detriment of the strategic level. At this level, he described the relationship between the people, the economy, the military, the government, and the nation that prevail during war.[13] Jomini's strategic link to the operational level concerned the statesman, who sets the political objective which determined the *Military Policy*, or military objective.[14] His discussion of strategic decisive points, bases of operation, lines of operation, and lines of communications was more consistent with FM 100-5's definition of operational art rather than strategy.[15]

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Clausewitz presented two basic tenets for the strategic level that remain applicable today. The first tenet concerned war's tendencies of violence, hatred and enmity, which Clausewitz believes flow from the people, the commander and his army, and the government, respectively. He stated that the people, military, and government must remain in balance or harmony in order to achieve war's goals.[16] The most quoted, and possibly the most famous tenet is: *war is merely the continuation of policy by other means.*[17] This tenet established Clausewitz' belief that politics sets the goal, and war (FM 100-5's strategy) is the means to attain this goal. In other words, the *political objective* determined the *military objective.*[18] This political objective represented his connection between the strategic and operational levels.

Both theorists attached great significance to what is now referred to as the operational level. Jomini's definitions of *Strategy* and *Grand Tactics* fell within the operational level. Jomini focused on decisive points, bases of operation, lines of operation, and lines of communications, which clearly reflect concepts relating to FM 100-5's operational level. His definitions emphasized four maxims that generally pertain to maneuvering an army to attack an enemy's decisive point or cut his line of operation, while negating the enemy's efforts to execute the same maneuver.[19] Jomini described *bringing the mass of the force in hand against a part of the opposing army , and upon that point the possession of which promises the most important result.*[20] Jomini's definition referred to what today would be

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considered the operational art of concentrating forces in time and space against the enemy. Jomini went further and described twelve orders of battle that allow concentration against the enemy's decisive point in battle. Jomini's operational art was the method of applying these twelve formations in combat.[21] This application was Jomini's connection between the operational level and tactics.

For Clausewitz, the operational level was *the use of engagements for the purpose of war* to attain the political objective.[22] He explained that space, mass, and time (the theater of operations, the army, and the campaign) must be properly sequenced to achieve this aim.[23] A key point in Clausewitz' description of this level was the need to exert all efforts against the enemy's center of gravity, or the hub of his power and movement.[24] In Clausewitz' approach, the effective use of space, mass, and time against the enemy's center of gravity was an art form.[25] For Clausewitz, the military objective established the association between operations and tactics.

Both theorists tended to agree on the elements which compose the tactical level of war. Jomini was inclined towards the battle as the principle event at the tactical level, and delineates three types of battle: offensive, defensive and unexpected or meeting on the march. He additionally grouped courage, genius, and fortune as elements of tactics.[26] These elements presented by Jomini compare to Clausewitz' view that moral forces, talent, and friction define the character of war.[27] Similarly, Clausewitz stated that *fighting is the central military act . . . engagements mean*

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fighting.[28]   He also placed engagements and battles as elements within the tactical level.[29]

While these descriptions traced a vertical hierarchial pattern for the levels of war for both theorists' concept of war, on the theoretical plane Clausewitz and Jomini created a non-linear pattern to explain the relationships between the levels. Jomini presented evidence of a bond that joins strategy and tactics. This interrelationship occurred in Jomini's description of a national political leader taking the field to perform "great actions" that could be done by his subordinate generals.[30] Clausewitz also theorized a strategic and tactical relationship. Clausewitz opined that *the reason for the effectiveness of most attacks lies in the general, the political conditions of war.*[31] He additionally furnished specific practical evidence of this theoretical connection between the strategic and tactical levels. He offered examples of national leaders at the strategic level who knew *everything turned on tactical results.*[32] For both theorists, political considerations represented a vital coupling of strategy with tactics. Jomini and Clausewitz drew the evidence for this theoretical relationship from their interpretation of the experiences of Frederick the Great and Napoleon.

The battle of Rossbach on 1757 demonstrated the impact of a tactical battle on the strategic level during the Seven Years' War (1756-1763). This conflict pitted Prussia against Austria, France, Russia, Saxony, and Sweden. During the war, Frederick successfully led his country in all three levels of war simultaneously. His

strategic war aims were to retain possession of Silesia, continue his dominance in central European politics, and win economic and military assistance from Britain. To achieve these political objectives while surrounded by three invading armies, Frederick organized a large mobile striking force and smaller frontier detachments. His operational plan sought to slow the penetrations of the enemy armies with his frontier defenses to allow the strike force, his *fire brigade*, to defeat each uncoordinated thrust. Frederick knew that the tactical victories of the strike force would blunt his enemies' enthusiasm to continue their invasion, and ultimately achieve his political objectives. Therefore, Frederick personally took the field and commanded the strike force. His defeat of a French army at Rossbach on November 5, 1757, quieted hostilities on the western frontier, and allowed him to turn his attentions toward the eastern frontier. More importantly, this tactical victory reversed the British strategic decision to provide only economic assistance to the Prussians, and began the British commitment of troops on the continent against France.[33]

The battle of Austerlitz in 1805 further illustrated the existence of a dynamic relationship between the strategy and tactics. The tactical defeat of Austrian and Russian forces by Napoleon's *Grande Armee* had strategically decisive repercussions for the vanquished and victorious powers. Significantly, this battle follows Clausewitz' representation of Napoleon as a national strategic leader who knew everything depended on tactical results.[34] In particular, Austerlitz serves to

illuminate the coupling of strategy to tactics and the non-linear inter-relationships of the levels of war.

At the strategic level, three major European powers were seeking to defeat the French and satisfy their own political goals in central Europe. Great Britain declared war on France in 1803. By 1805, Russia joined England to maintain its influence in the Levant, to avenge the execution of a Bourbon prince, and to increase its influence in Europe. Austria joined with these two countries because of its unfavorable political position as a result of two unsuccessful wars with France, and to nullify the wedge the French were driving between its Italian and German spheres of influence. These nations formed the Third Coalition, and desired a return to the 1789 boundaries and political status quo.[35]

French strategic goals centered on further extending their influence into the German states and northern Italy, while isolating Britain from the continent. Napoleon translated these strategic political objectives into military objectives in his operational plan. Napoleon chose to fight in central Europe and northern Italy against Russia and Austria to strike a blow against his major enemy, Britain. While his 25 million French population seemed no match for the 66 million Europeans in the coalition, Napoleon's operational and tactical skill made the difference.[36]

At the operational level, the Third Coalition endeavored to achieve its strategic goals by removing French forces from North Italy, Hanover, North Germany, Holland, Switzerland, and Naples.[37] Therefore, the alliance's operational plan

featured three offensive campaigns and two defensive operations. First, Austrian Archduke Charles of Austria would lead the main effort into northern Italy with 95,000 men to capture Mantua, Peschiera, and Milan, while Archduke John of Austria with 23,000 soldiers secured the Tyrol. Second, Austrian Archduke Ferdinand, with General Mack as his chief of staff, would march 70,000 troops into Bavaria to cover the advance of the Russians. Eventually, Russian armies of 35,000 under Marshal Kutusov and 40,000 under Marshal Buxhowden would join Mack's army and advance toward Strasbourg. The third operation called for Marshal Bennigsen to advance south of Prussia toward Franconia with 25,000 men. Defensively, the Austrians would furnished a corps to the Swedes in Pomerania and a corps to the British in Naples to stretch Napoleon's limited resources.[38]

After Napoleon defeated Archduke Ferdinand and General Mack at Ulm and captured Vienna, the allies' operational plan changed significantly. First, the northern Italy offensive ground to a halt, then Archdukes Charles and John combined forces and began moving toward Vienna from northern Italy. Second, Marshal Kutusov and two Austrian corps began withdrawing east away from Napoleon's army. Third, Bessigsen's army of 25,000 remained on the northern flank in Bohemia. These changes to the allies' operational plan flanked Napoleon on the south and north, and caused him to overextend his line of communication as he moved east toward Kutusov.[39]

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Napoleon's operational plan called for his army to maneuver against the Austrian and the Russian army under Kutusov in eastern Austria. He additionally encouraged Marshal Massena to pressure Archduke Charles in northern Italy, while dispatching Marshal Marmont's corps southward from Vienna to defend or warn of any Austrian moves along the southern flank. Moving his remaining corps along various routes and through successive engagements while deceiving Kutusov as to his intentions, Napoleon continued to pursue the Russian and Austrian army.[40]

Eventually, Napoleon realized the seriousness of his situation as the *Grande Armee* moved east. With Archduke Charles in the south, Bessigsen in the north, Kutusov to his front, and a long precarious line of communication, Napoleon began to evaluate his situation. Continuing east could lead to defeat as the allies' trap sprung from three sides. Defeat, or even retreat, would cost him the strategic objectives he set out to gain.[41] Apparently, Napoleon had run out of operational alternatives.

Napoleon came to realize that only by quickly bringing Kutusov's elusive army to defeat in a final tactical battle could he reverse the situation and achieve his strategic objectives.[42] Napoleon chose the tactical battleground of Austerlitz, which covered an area of approximately eight kilometers by ten kilometers and consisted of parallel ridges with the highest elevation in the enemy's center. Napoleon's 73,200 faced 85,700 Austrians and Russians under the command of the two monarchs, Tsar Alexander I of Russia and Emperor Francis I of Austria, who had

arrived on the battlefield. Napoleon's tactical plan was to deceive the enemy as to

his real strength in the center, lure the opposing army to the south, then attack in

their center and swing behind the enemy's north flank. The monarchs' plan, as

outlined by Major-General Weyrother, called for a mass attack in the south to cut

the road to Vienna and Napoleon's retreat, then to roll up the French army from

south to north. Troop movements began the morning of December 2 at 4:00 AM

under foggy conditions, while fighting started at 7:00 AM and lasted until a general

cease-fire around 5:00 PM. However, the tactical decision was reached in

Napoleon's favor by noon when a French corps under Soult, the Duke of

Dalmatia, established itself in the allies' center at Pratzen.[43]

The political significance of this tactical victory reveals the dynamic

interrelationships between strategy and tactics. The victory completely altered the

strategic situation. Austria immediately sued for peace and Russia withdrew to the

east, fulfilling the French strategic objective of humbling Britain's two allies and

isolating that nation. What is more important, Prussia, which had previously

decided to open hostilities against the French, reversed its decision, becoming

isolated from any potential assistance against future French military actions. The

Treaty of Pressburg ended Britain's diplomatic scheming and the hopes of the

Third Coalition.[44]

From these historic examples, Jomini and Clausewitz perceived a powerful

political affect of tactical victories on strategic decisions. These two theorists,

writing at the end of the Agrarian Age, understood that a dynamic existed that coupled strategy to tactics in theory and reality. Undoubtedly, Jomini and Clausewitz grasped the non-linear relationships between the levels of war, which shows that the concept is not unique to the Information Age. Additionally, they pointed out a dynamic interrelationship between the functions of a national leader at the strategic, operational and tactical levels. Toffler advocates could misperceive this phenomenon based on the theorists' writing style and the difficult concepts they introduced concerning war. However, their argument that the non-linear relationship is made possible only by the technology present in the Information Age is not true. For the Agrarian Age, the non-linear pattern surfaced in the theories of Jomini and Clausewitz, and occurred during war, particularly at Rossbach and Austerlitz. Does Toffler's Second Wave, the Industrial Age, possess examples of the strategic, operational, and tactical levels behaving similarly in a non-linear fashion?

SECTION THREE

The Industrial Age - Toffler's Second Wave

Toffler's advocates assert that Industrial Age, or Second Wave, warfare existed under a vertical hierarchy for the levels of war. Primarily this relationship between strategy, operations and tactics resulted from requirements for a command structure to control the large armies developed during this period. While this vertical hierarchy ran counter to Jomini's and Clausewitz' theoretical non-linear relationships between the levels of war, warfare still reflected these theorists' concept of a dynamic coupling of strategy and tactics. However, the vertical hierarchy influenced military command systems and received acceptance throughout the Industrial Age. While that hierarchy existed for command purposes, the non-linear phenomenon continued throughout this period.

The Prussian tactical defeat of the Austrians at Koniggratz (Sadowa) on July 3, 1866, demonstrates the existence of the non-linear pattern for the levels of war during the early Industrial Age. The Industrial Age, or Toffler's Second Wave, had just begun when this battle was fought.[45] Koniggratz saw the use of several technologies developed during the early Industrial Age. Principal among these inventions were the steam locomotive, telegraph, rifled breech-loading artillery, and breech-loading infantry rifles. However, it is important to note, that both sides continued to rely on Agrarian Age animal power as their primary method of transportation. The horses' hooves and the soldiers' feet set the pace of the Prussian and Austrian armies.[46] Nevertheless, the dynamic relationships between

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strategy, operations and tactics gave this tactical battle achieve far-reaching strategic significance. This example is additionally interesting because it demonstrates the presence of the non-linear pattern coupling strategy and tactics when the military command structure is based on a vertical hierarchy.

To comprehend the significance of Koniggratz, one must understand the central European balance of power as established under the terms of the Congress of Vienna. After Napoleon's final defeat at Waterloo, Britain, France, Austria, Prussia and Russia worked out a system to strengthen the weak Germanic countries of central Europe. For centuries, France had invaded this area for territorial gains. The Vienna settlement eliminated this temptation by organizing the German Confederation, a grouping of nearly 300 minor German states, and arranging for their common defense against aggression. The Confederation's power would be sufficient to thwart a French invasion, yet pose no threat to neighboring countries. This political situation was acceptable as long as Prussia and Austria maintained their relative strengths and influence as established in 1818. Such a balance placed Prussia in a its junior partner status with Austria.[47]

Prussia in the mid 19th century was attempting to break the shackles of the Congress of Vienna and unify the Confederation under its growing influence, while reversing the power balance with Austria. Otto von Bismarck, the Prussian Chancellor, engineered this policy. His strategic goals sprang from his view of Prussia's destiny. Bismarck was convinced Prussia's destiny was to dominate in central Europe and become a great power. He therefore worked to eclipse Austrian

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influence and unite Germany under Prussian leadership. The first step occurred in 1864, when Prussia and Austria united against Denmark. As a result of that war, Prussia gained the province of Schleswig-Holstein. Disputes with Austria emerged over the ceded territory, and Bismarck was able to seize on these to spark the war he wanted with the Austrians, and clear the way for German unification.[48]

While Bismarck caused Austria to make the first move and mobilize, the window of opportunity for a quick Prussian victory began to shrink. Austria promptly entered negotiations with the lesser German states to enter the war on her side. Bismarck partially forestalled this intervention through diplomacy, but several states, including Bavaria, Hesse, and Baden, were leaning toward Austria. These states could add 150,000 soldiers to expand the conflict and cause a protracted war on two fronts. To increase Prussian worries, Napoleon III of France could enter the war as an Austrian ally to expand his influence within central Europe.[49]

The Austrian monarchy's strategic aims centered on maintaining its influence and prestige within the German Confederation. These political objectives were exactly opposite Bismarck's goals. Austria recognized the growing prestige of Prussia in central Europe. Weakened during the Revolution of 1848, the Viennese court became increasingly fatalistic during the spring of 1866, leading Emperor Francis Joseph remark, *"How can one avoid war when the other side wants it?*[50]

This anxiety caused Austria to mobilize on April 21, 1866. Additionally, Austria began seeking military support from its southern German neighbors, who were waiting to join once the fortunes of battle became clear.[51]

The Austrian operational plan derived from the political objective of maintaining the international status quo. The Austrians considered two options in their planning -- both offensive. They could drive from Moravia into the Prussian province of Silesia or thrust toward Berlin from Bohemia. Neither plan came to fruition. The inadequacy of the Austrian mobilization plan and the availability of only a single railroad line leading into northern Austria served to negate both options. *Feldzeugmeister* Ludwig August von Benedek's army slowly organized at the key rail center of Olmutz in Moravia, allowing seven weeks to pass following the mobilization order before moving north. This delay cost the Austrians the initiative. Because of these difficulties, Benedek's operational plan devolved into defending his support base and the lines of communication to Vienna.[52]

General Helmuth Karl Bernhard von Moltke, the Chief of the General Staff, was the Prussian operational commander. Moltke was well aware of the direction of Bismarck's strategy, clearly grasped the regime's political objectives; as early as 1860, he began planning for a war against Austria.[53] He recognized Austria's two operational choices and, according to his preference for flexibility, chose to disperse the Prussian army along the southern borders of Bohemia and Moravia. This dispersion served Prussia in two ways. First, it negated Austria's mobilization advantage. While the Prussian army lost the early initiative by not conducting full mobilization until May 12, their ability to use five railroad lines changed that precarious situation. The Prussian army prepared more quickly for war than the Austrian army under Benedek. Second, the military would be in a position to

defend Prussia, attack Austria, or a combination of these two options should some of the German states or France enter the conflict. While many in the Prussian army criticized this dispersion of the deploying armies and wanted them concentrated in a single mass, they failed to understand Moltke's concept for the subsequent movement of the armies. Moltke meant to concentrate these forces as they moved toward Benedek's army in Moravia. Consequently, the Prussians advanced along three separate army lines of operation that converged at Gritschin near the Austrian center of gravity -- Benedek's army. The defeat of this Austrian army under Benedek was the military objective.[54] After several smaller engagements along each axis of advance, the final tactical showdown commenced near Koniggratz, major crossing site on the Elbe River.[55]

Moltke's inability to foresee the battle of Koniggratz sharply contrasts with Napoleon's foresight at Austerlitz. Where Napoleon realized he had to bring Kutusov's army to battle and chose the battlefield, Moltke lost contact with Benedek's army for forty-eight hours before the battle. As Martin Van Crevald asserts, Moltke *had no part in planning it* [the battle], *and it may indeed have been fought against his will.*[56] Additionally, Moltke's own evaluation of the engagement revealed that the Prussian Chief of Staff was unable to influence the tactical action.[57] Moltke primarily got the armies into the vicinity of Benedek, then the tactical commanders executed fire and movement to destroy the Austrian army. The battle of Koniggratz was purely a tactical engagement without any operational command or control.

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The battle of Koniggratz occurred on July 3, 1866. The battlefield measured approximately twenty kilometers by twenty-five kilometers, nearly three times the size of Austerlitz. 255,000 Prussians faced 210,000 Austrians across the Bistritz River, as small fordable stream flowing diagonally across the battlefield from northeast to southwest. From this river, the terrain rose gently eastward with several hill masses that commanded the Prussian approach from the west and north.[58] Benedek's army arrived on July 1, and immediately began to strengthen the ground for defense by entrenching, emplacing obstacles, and sighting artillery. The Austrian commander's plan was to wear down the attacking Prussians with a deliberate defense, then launch his reserves in a counterattack against the Prussian center.[59] The commander of 1st Prussian Army, Prince Frederick Charles, designed the Prussian tactical plan. His concept called for a frontal attack by the 1st Prussian Army from the northwest and a supporting flank attack in the south by the Army of the Elbe. Additionally, Frederick Charles had sent a messenger to the 2nd Prussian Army commander, Prince Frederick William, requesting his support during the battle. The Prussian King approved Prince Frederick Charles' plan, then Moltke approved it without any modifications. Because of this *fait accompli*, the operational commander had little if no impact on the tactical plan.[60] Prussian movements began the evening prior to the battle and continued into the early morning. Fighting commencing at 8:30 AM, and lasted until the final artillery volley covering the Austrian army retreat at 9:00 PM. However, the tactical decision was reached in the Prussian's favor around 3:00 PM, when elements of

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the 2nd Prussian Army seized the hill mass at Chlum establishing a wedge in the center of the Austrian defenses.[61] This action began to crumble the Austrian defense, which led to their retreat toward Vienna.

This tactical victory gained for Prussia its long sought strategic position as the preeminent power in central Europe, revealing the dynamic interrelationships between strategy and tactics. Similar to Austerlitz, the victory completely altered the strategic situation. One aspect of this shift was the immediate swelling of Prussian military prestige, and the dramatic shift in the strategic political balance of power. The quick victory kept Napoleon III and the lesser German states from introducing their armies into the conflict and protracting the war. While not immediately altering the map of central Europe, the tactical victory served as the catalyst for scrapping the balance of power established by the Congress of Vienna.[62] Under the Treaty of Prague signed August 23, 1866, Prussia annexed several north German states and replaced the German Confederation of 1815, dominated by Austria, with a Prussian-controlled Confederation which excluded Austria.[63]

Significantly, Koniggratz demonstrated the dynamic non-linear relationships between the levels of war. The strategic level set the political objective to increase Prussian strategic influence at Austria's expense. Moltke, the operational level leader, translated Bismarck's political objective into a campaign with the military objective of destroying Benedek's Austrian army. This military objective connected the operational plan to the tactical commander's plan for attacking the

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Austrian Army. The tactical defeat of Benedek's army at Koniggratz achieved the political objective of expanding Prussian strategic influence. The non-linear pattern correctly depicted the interactions between the levels of war that occurred at Koniggratz.

Following the victory in 1866, Prussian went on to defeat another great European power, France, propelling the Prussian system of military doctrine to world prominence. The defeats of Austria and France surprised many military observers, and established Prussia as the preeminent land power in the world. The architect of the Prussian army's victories was Moltke, the Chief of the General Staff. Relatively obscure prior to 1866 outside his country, his thoughts became pivotal to European and American military doctrines through the end of the 19th century and into World War I.[64] As the German army expanded and grew to enormous proportions, the command system to handle such unwieldy formations required modification. It was Moltke, a disciple of Clausewitz, who instituted the vertical hierarchy for the levels of war as a result of his experience leading the cumbersome Prussian army. He insulated the tactical level from the strategic level, and initiated the pattern that placed the operational level between strategy and tactics -- the vertical hierarchy.

In Moltke's view, the Chief of the Prussian General Staff was the link between the politicians and the tacticians. Moltke made this distinction based on three considerations. First, he believed the Chief of the General Staff was the preeminent advisor on political and military issues to the politicians during war. In

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his view, the Chief of the General Staff determined the military plan to be followed. The politicians should have little if any responsibility for influencing military operations. By keeping within this role, Moltke shielded the tactical commander from strategic political concerns. This insulation cut the strategic level's link to the tactician.[65]

Moltke additionally held a unique view of orders based on Clausewitz' theory of friction. He found that friction, occurring once the Prussian armies became engaged, significantly changed any complex military plan. He believed that a series of *expedients*, or new orders, needed to be given once the army completed mobilization and crossed the national border. Therefore, in his role as Chief of the General Staff, he gave general guidance to his tactical commanders and allowed them flexibility to implement his outline for the campaign. Although on occasion Moltke deviated from this pattern, he mainly kept to this principle. Moltke pursued this command style because he believed the tactical commander's training would ensure he made the correct tactical decision within the overall scheme of maneuver.[66] By not issuing specific orders to tactical commanders during the battle, Moltke protected the tactical level from strategic interference.

Lastly and most importantly, Moltke removed political objectives from the tactical commander's responsibility. Moltke's isolation of political objectives from military objectives negated Clausewitz' theoretical connection between strategy and tactics. He believed that the tactical commanders must keep their mind on their military objectives, and not be swayed by political considerations. He stated that

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for the tactical commander *what policy can do with his victories or defeats is not his business.*[67] Moltke believed it was his duty as Chief of the General Staff to remain concerned about political objectives, not his tactical commanders.[68] This view of political objectives again insulated the tactical level from the strategic level.

Moltke's command system established the Chief of the General Staff as the connecting link between the strategists (The King and Bismarck) and the tacticians (army commanders and lower). Figure #3 depicts the Moltke model. Moltke's role as the Prussian Chief of Staff places him in the operational level with an association to the strategic level based on political objectives. His elaboration of military objectives through orders served as the conduit for communications between the strategic level and tactical level.

Figure 3
The Moltke Model

Moltke changed the theorists' connection of strategy to tactics based on his military leadership experience. Rightly or wrongly, such a command system influenced European and American military institutions during the First World War.

The principle antagonists fighting in the western theater had all adopted systems similar to the Moltke model by 1918. Predictably, Germany continued the Moltke system, but military leaders became increasingly isolated from strategic political concerns. In their case, the politicians and military combined to oust the

chancellor, Bethmann-Hollweg, because of his attempts to inject politics into the
military effort. This concept ran contrary to contemporary German viewpoints,
and served to bring in the Hindenburg-Ludendorff team and military control of the
government. A grand strategy conference held on November 11, 1917 best
exemplifies the separation of military objectives from the strategic level. With
Ludendorff as chairman, the assembly busied itself with finding a military solution
to winning the war, and their discussions were completely divorced from any
political objectives.[69] Such a strategy proved disastrous and serves as a practical
example of the problems associated with misinterpreting the theoretical connections
flowing from politics in Jomini's and Clausewitz' theories. The Moltke command
system arose from practical experience and maintained the theoretical relationship
of politics at the strategic and operational levels. Contrary to this system, Germany
in late 1917 and throughout 1918 displaced this political connection with ruinous
results.

On the other hand, political considerations acted as a connection between the
strategic and operational levels for the Allies. Surprisingly, the British came closest
to emulating the German war experience with the Moltke command system.
Unlike Bethmann-Hollweg, who attempted to insure the war remained an
instrument of policy, British politicians tried to keep out of the way of the military.
Either because of a lack of military expertise or a fear of public rebuke, Prime
Ministers H.H. Asquith and David Lloyd George busied themselves with war aims
(political objectives) and supplying the fighting, while Sir Douglas Haig shaped

military planning and execution. The conventional wisdom of that period as expressed in London newspapers and the House of Commons called for politicians not to interfere with the soldier doing his military duty. Because of a lack of expertise and the weight of public opinion, the British during World War I placed the three levels of war into a hierarchical relationship. Like the Moltke model, politicians set strategic political objectives and supplied the army, while the operational military leaders such as Haig launched campaigns and issued orders to tactical units.[70]

France took an opposite approach. The French politicians began the war using the Moltke model, but as the fighting dragged on, the political leaders reclaimed their right to set political objectives. As in England, early French politicians lacked military expertise and fought public criticism when attempting to shape military decisions. By 1917, after the ill-fated Nivelle offensives which caused several mutinies in the army, public opinion turned against the military and allowed the French premier, Georges Clemenceau, to begin influencing the direction of the war effort. Clemenceau meshed military and political objectives, appointed new troop commanders, and advocated and established a unified commander, Marshal Ferdinand Foch, during the dark days of the Ludendorff offensives in the spring of 1918. Under the French system, the strategic leader, Clemenceau, would also involve himself with the operational level, but he remained aloof from the tactical fight. In France at this time, there was no interaction between the strategic level and the tactical level. The French command system continued the political

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connection between strategy and operations.[71]

The American experience in the Great War mirrored their allies. The American democratic tradition called for the politicians to raise and equip forces, then stand back as the military leadership ran the war according to the political objectives. True to this tradition, Congress and President Woodrow Wilson set the war aims, then undertook to transform the country's industry and create the necessary army to fight in this European war. With the American General Staff recently established in 1903, the direction of military operations should have remained in a Moltke model with the Army Chief of Staff as the operational level commander. But the Americans deviated from this Prussian system, and by-passed the Army Chief of Staff in the operational decision-making process. The Americans instead sent GEN John Pershing to Europe with nearly complete authority to use the American Expeditionary Force as necessity dictated with only technical subordination to the Army Chief of Staff. Pershing assumed a Moltke-like command style, and his early efforts concerned stopping the Allies from dissipating American troop strength. Mainly, Pershing dealt with his corps commanders, rarely involving himself in tactical minutia.[72] The reins of the strategic level and the tactical level are placed in the hands of the operational commander with political objectives or war aims to guide his decisions. In the American situation, the operational commander was Pershing. Political considerations remained an element of the American military command structure, which was influenced by the Moltke model's vertical hierarchy for military command.

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The late 19th century and World War I saw the development of the vertical hierarchy as a means of military command. While this vertical hierarchy ran counter to Jomini's and Clausewitz' theoretical relationship between strategy and tactics, political considerations remained an element of the operational level. Only when political considerations were completely excluded did problems develop, as witnessed by Germany in 1918.

This Moltkean model, or vertical hierarchy for command, remained the basis for controlling military forces through the inter-war years and into World War II. The American experience is a case in point. The National Defense Act of 1920, for example, ensured vertical hierarchy for command in the American military. This act called for the president and his advisers to set the political objectives for war, while a Joint Board, the Army Chief of Staff and the Chief of Naval Operations, the Secretary for War, and the Secretary of the Navy determined the military objectives that supported the policy. Operational commanders, emulating Pershing's role in World War I, were the theater commanders. Under them were the tactical commanders. This command structure, a vertical hierarchy, planned and executed a tactical event that had strategic impact in the early days of World War II in the Pacific theater.[73]

In January 1942, a month after Pearl Harbor, a proposal emerged an air attack on Tokyo, a tactical event that had a strategic impact.[74] This mission, known as the Doolittle Raid, demonstrates the dynamic relationship between the levels of war during the heart of the Industrial Age. At this time, Toffler's Second Wave was in

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full swing. Industrial Age engines (gasoline, diesel, and oil burning) powered the ships and aircraft that allowed the mission to be conducted. Additionally, the bombs were aimed at the manufacturing centers of the Industrial Age -- factories and assembly plants. Nonetheless, the dynamic relationships between strategy, operations and tactics is evident in this tactical event. Here again, as at Rossbach, Austerlitz and Koniggratz, a tactical engagement achieved significant strategic consequences, demonstrating the dynamic connections within the non-linear pattern for the levels of war.

The Japanese political objectives in the war arose from their determination to create a *Greater East Asia Co-Prosperity Sphere* over an area roughly stretching from Siberia through Australasia. With these strategic objectives, Japan laid out military objectives and prepared operational plans to achieve its war aims.[75] In less than five months from 1941 to 1942, the Japanese military had secured the Dutch East Indies, the Philippines and Southwest Asia to insure the continued flow of oil and other essential resources for its industry. The Japanese military then planned to defend in the central Pacific, Southeast Asia, and China. The Japanese based their operational plan on the concept of a defensive war of exhaustion. Their past experience in wars against Russia and China had convinced them that the enemy's attempts to invade Japan would prove too costly, and the attacker would eventually negotiate a settlement.[76]

A common concern throughout the Japanese strategic and operational discussions was insuring the security of the home islands. Strategically, the

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Japanese armed forces could not allow harm against the population or, most importantly, Emperor Hirohito, the symbol of the nation. This political objective became a military obligation for the navy, which received responsibility for homeland defense.[77]

While American strategic policy called for a Europe First approach, political considerations and military reality required some form of response to Japanese aggression. After several months of seemingly endless Japanese victories, the Pacific situation demanded an American military success to rally its citizens. Such a morale boost became the primary strategic objective. Developed through the vertical hierarchy of the American military command system, the Doolittle Raid was conceived at the strategic level, evolved into a joint operation, and executed at the tactical level.[78] The military objective, developing from the strategic propaganda requirement, was to attack the Japanese mainland from the air to demonstrate to the American public the military's ability to conduct successful offensive operations. Because the Navy and Army Air Corps lacked aircraft with the required range for such a mission, the planners recommended a joint solution. The operational plan called for Navy aircraft carriers to transport Army Air Corps bombers near Japan and launch them. The bombers would then fly to their targets, drop bombs, and land in China.[79] Once the airplanes took-off, the raid became a tactical event, similar to Jomini's or Clausewitz concept of an engagement.

The Doolittle Raid occurred on April 18, 1941. The battlefield for this engagement encompassed the sky lower than one thousand feet above the island of

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Honshu. The engagement featured eighty United States airmen in sixteen B-25 bombers against the home island population of Japan. Doolittle planned for the aircraft to fly to their targets, drop a mixture of demolition and incendiary bombs, then continue their flight and land in China.[80]

The Japanese home defenses began with a line of small fishing vessels that provided early warning at six to seven hundred miles from the islands. The next layer of air defense consisted of one to two hundred fighter interceptor aircraft, about one hundred ground based 75mm antiaircraft guns, and a variety of barrage balloons.[81] Doolittle's aircraft began taking-off at 8:20 AM with all sixteen bombers airborne by 9:20 AM. Enroute, Doolittle encountered several small boats, a land-based patrol aircraft, three flights of fighters, and barrage balloons. He received little damage from air defense activity, and succeeded in dropping his bombs over his Tokyo targets.[82] Overall, his bombers flew for nearly thirteen hours and covered 2,250 miles before crews in many cases parachuted after running out of fuel.[83] While the mission resulted in the relatively little damage to assigned targets and the loss of all the aircraft, these tactical losses were fully offset by the boost in American morale.[84]

Even more important than its positive impact on public opinion in the United States, was the shock it delivered to Japanese confidence. This minor tactical engagement demonstrated the vulnerability of the home islands to airborne attack, and posed a direct threat to the Japanese emperor. Because the continued safety of Hirohito was a political objective, the Japanese operational plan had failed to meet

this requirement. To rectify the strategic situation, the Japanese adopted a new operational plan that shifted the main war effort from defense to an offensive operation into the central Pacific to establish a deeper defense. The offensive they undertook resulted in the Battle of Midway, the climatic event of the Pacific War.[85] Here again, as at Rossbach, Austerlitz and Koniggratz, a tactical event effected the political objectives at the strategic level. Thus the Doolittle Raid serves to further illuminate the dynamic non-linear relationships within the levels of war.

Undoubtedly, the non-linear relationships between the levels of war existed in the Industrial Age. While Jomini and Clausewitz proposed these dynamic relationships in the Agrarian Age, this phenomenon continued in the Industrial Age. In the early years of this period, the battle of Koniggratz demonstrated a continuation of this occurrence from the Agrarian Age. Because military forces increasingly expanded during Industrial Age warfare, achieving effective command required placing the levels in a vertical hierarchy, primarily under the Prussian General Staff system or Moltke model. However, tactical events still molded strategic decisions. Even in World War II, possibly the peak of the Industrial Age, tactical events impacted strategy as illustrated by the Doolittle Raid. These two tactical events are not the only examples of these circumstances occurring during the Industrial Age which Toffler's advocates fail to perceive. While they maintain that only Information Age technology makes the non-linear pattern possible, the Industrial Age revealed examples of the strategic, operational, and tactical relationships behaving in a non-linear fashion.

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SECTION FOUR

Conclusion

The unique technology introduced during the Information Age has not produced a revolution in military affairs concerning the levels of war. Toffler advocates failed to notice the non-linear connections between strategy, operations, and tactics during the Agrarian and Industrial Age. Throughout the First and Second Waves, tactical events directly impacted on the strategic level, demonstrating that non-linear relationships existed over the last two hundred years.

Two Agrarian Age theorists, Jomini and Clausewitz, were the first to conceptalalize the levels of war. Their theories grasped a coupling of strategy to tactics, based on the experiences of Frederick the Great and Napoleon. Misperceptions developed and obscured the meaning of this strategy to tactics affinity based on the theorists' writing style and the difficult concepts that dealt with war. However, historical examples, particularly Rossbach and Austerlitz, reveal the powerful political impact of tactical victories on strategic decisions. The argument that the non-linear relationship is possible through the technology present in the Information Age is disproved by these events during the Agrarian Age.

The late 19th century and World War I saw the development of the vertical hierarchy as a structure for military command as a response to the unwieldy proportions of the Industrial Age armies. While this vertical hierarchy ran counter to Jomini's and Clausewitz' theoretical relationship between strategy and tactics, political considerations remained an element of the operational level. Only when

political considerations were excluded, such as in Germany, during the last two years of World War I did problems develop. This vertical hierarchy system of command, or Moltkean model, continued to shape command structures through World War II. But, while this hierarchy existed for command purposes, the non-linear phenomenon remained applicable to explain the relationships between the levels throughout the Industrial Age.

The latest edition of FM 100-5 continues to follow the vertical hierarchy, similar to the Moltke model, for the Army's command structure. While the fundamentals within strategy, operations and tactics were based on the theories proposed by Jomini and Clausewitz, the manual fails to address the non-linear relationships between the levels of war. To remain with this vertical hierarchy is similar to the automobile driver not pumping gas into his vehicle. Using the analogy of the automobile, as explained in the *Introduction*, the minute functions of the engine represent the tactical level, car's major systems are analogous to the operational level, and the act of driving on a road illustrates the strategic level. When the gas gauge registers empty, the driver fills the tank. If a tire looks flat, the driver changes it or adds air. When the thermostat shows hot, the driver adds water and coolant. These circumstances are comparable to a tactical event impacting on strategy. The Army must realize that such events occur, and re-examine its doctrine to include this phenomenon.

Many of the concepts for developing a model depicting the non-linear relationships for inclusion in FM 100-5 are present in this monograph. The

definitions of strategy, operations and tactics as expressed in Jomini's and

Clausewitz' theories and the historical examples provide some of the concepts to

construct the necessary terminology. Figure #4 illustrates the new non-linear
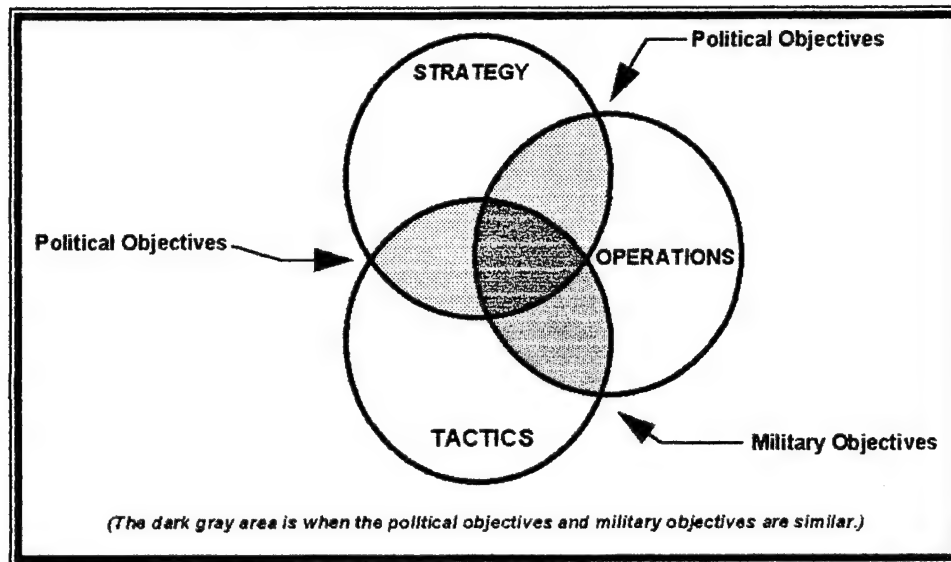

Figure 4
The Non- Linear Pattern

model. The strategic level continues to be defined as *the art and science of*

employing the armed forces and other elements of national power during peace,

conflict, and war to secure political objectives. The major alteration required in

doctrine is the concept of a "vital link" between the levels. FM 100-5 asserts the

operational level provides this connection. Based on the dynamic interrelationships

between strategy, operations and tactics discovered in this monograph, the true

"vital link" should be political objectives and military objectives. The operational

level should become *the use of engagements for the purpose of attaining the*

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military objective *leading to the achievement of political objectives*. The plain

italicized portion furnishes a connection to the tactical level, while the bold italisized

portion pertains to its relationship to strategy. Because the tactical level couples

with strategy and operations because of relationships resulting from political and

military objectives, its definition must also be adjusted to reflect these unions. The

tactical level is *the employment of forces to win engagements and battles, thereby*

achieving military objectives and political objectives. Here, the plain italicized

section provides the tactical coupling with the operational level, while the bold

italisized words serve to illuminate the tactical connection to strategy.

While the Toffler adherents fail to discover a new paradigm for war in the

Information Age, a new way of defining the levels of war has emerged. Unique in

its own right, the non-linear relationships between strategy, operations and tactics

unlocks a multitude of possibilities for studying warfare. The Army has discovered

this concept, it must now begin to educate its soldiers about the non-linear

relationships between the level of war.

ENCLOSURE

The Beginning's of Operational Art: Frederick's Invasion of Bohemia, 1757

The modern concept of operational art began in 1757 when Frederick the Great invaded Bohemia. Before this operation, warfare mainly consisted of limited war fought during seasonal campaigns. These eighteenth century wars featured limited resources and limited strategies that sought only territorial gains without any operational initiatives. During the Bohemian campaign, Frederick introduced several features of modern operational warfare. This campaign represents the first incident of the operational art as defined by the criteria introduced in Course Four, Military History.

Prior to the Seven Years War, the military art consisted of simple strategy with simple tactics. The monarchial armies fought campaigns in a seasonal fashion between late spring and early fall. Their strategies focused on securing territories, annexing them, and reaping the rewards of newly won land. The strategic objectives the enemy armies fought over consisted of fortresses, magazines, supply lines and key positions. The numbers of soldiers and resources employed to sustain these conflicts were small. With minor assets tagged for battle, the survival of the ruling monarchy remained assured. Tactics consisted of maneuvering to gain terrain dominance or positional advantage over the opponent. The typical tactical fight of this period revolved around semi-trained soldiers moving in parade ground fashion in a modest-sized, open meadow.[86] These battle ingredients caused this period of classical warfare being named the age of limited wars.

Prussian combat actions during the Bohemian Invasion drastically altered the existing limited warfare pattern in three manners. First, Frederick's strategy was different. Prussia faced Russia, Austria, Sweden, and France, who combined to destroy his puny kingdom. In this war, Frederick fought for the survival of his monarchy not merely retaining the province of Bohemia.[87] Second, Frederick used an operational plan to fulfill his strategy. This plan sent two defensive forces with minimal troops to stave off Russia and Sweden, while four columns attacked along a 130-mile front to destroy the main concentration of the Austrian Army near Prague. Frederick sought to defeat the Austrians, who were vulnerable for about six weeks, before the French Army arrived in Bohemia. He invaded with the two western columns pushing south astride the Elbe River toward Prague, while the two remaining eastern columns advanced toward the rear of Prague.[88] Lastly, the entire Prussian Army fought using unique tactics. Frederick had won many battle because of the firepower of his infantry. Unlike the parade ground movements of its opponents, the Prussians drilled to perfection their musket firing procedures and tactical mobility. These unique tactics also concerned a revolutionary flank attack called "oblique order."[89] Because Frederick created new strategic, operational, and tactical innovations, the Bohemian Invasion revolutionized the classical limited warfare of this period.

This Prussian invasion portrays the beginning of modern operational art as defined by the criteria from the Military History Course. In fact, there exist many similarities between this campaign and Napoleon's Campaign of 1809.

First, Frederick's strategy called for the survival of his country against four

enemies. He chose to defend against two (Russia and Sweden), and attack the third (Austria) before the fourth (France) could interfere. This offensive against Austria signifies an integral part of his strategic plan to save his kingdom. Napoleon conducted a similar strategy in 1809. He placed minimal forces against Britain in Spain, and diplomatically isolated then militarily defeated Austria.

Second, the Prussian campaign effectively linked strategy to tactics. Frederick maneuvered his forces to engage and defeat the Austrians in a tactical battle near Prague. This maneuver is similar to Napoleon's desire to engage the Austrian Army near Abensberg.

Third, this advance possessed distributed maneuver because of the distances involved and the objective of a decisive point near Prague. The main Prussian Army advanced along a 130-mile front with the eastern columns frontally attacking toward Prague, while the western columns moved to the rear of Prague. These distances compare to Napoleon's maneuver to trap the Austrian Army between the Isar and Danube Rivers.

Fourth, the opposing forces were symmetrical and approached a corps-type organization. The Austrians fought using a regimental system and the same weapons as the Prussian Army. While not named as a corps, they possessed rudimentary staffs and approached the corps in size. From east to west, the Prussian columns numbered 19,300 soldiers, 39,600 soldiers, 20,300 soldiers, and lastly 34,000. The Austrians were arrayed in groups of 24,000 soldiers, 30,000 soldiers, 28,000 soldiers, and 27,000.[90] France and Austria possessed true corps organizations, yet these Prussian and Austrian forces approach the 1809 corps sizes

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of 25,000 - 30,000.

Fifth, the Prussians employed decentralized command and control. Each advancing column possessed a commander with specific orders for the invasion. Prince Moritz lead the eastern most column, while Frederick was his overall commander and lead the second column. Field Marshal Schwerin commanded the western forces consisting of his column and the Duke of Bevern's column. The French columns in 1809 also received detailed instructions on routes and timings.

Sixth, the Prussian advance exhibited sequenced and simultaneous engagements. Specifically, orders to Moritz and Bevern were for independent movement and raids to confuse the Austrians, then to unite with Frederick and Schwerin respectively. Once the two major forces united, Frederick's pushed an Austrian force south along the Elbe, while Schwerin's moved independently against another Austrian force toward the rear of Prague.[91] Napoleon employed his northern corps to confuse Charles, while he attempted to maneuvered the southern wing of Massena's corps to the Austrian rear.

Seventh, as discussed above, the Prussian Army possessed a common understanding for their unique tactics or doctrine. But, these procedures extended into higher level methods. Frederick, a prolific writer, wrote three military works that included instructions on technical, campaign and tactical procedures. These doctrinal works were *Prinicipe generaux de la guerre* written in 1746, *Testament politique* written in 1752, and *Principes generaux* provided as an attachment to the latter. The Prussian field marshals read and understood Frederick's methods from these books. The French field marshals fought alongside Napoleon for many years

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and comprehended his battle methods, while their subordinates routinely employed *l'ordre mixe* and the *Ordinance of 1791* for tactical engagements.

The Prussian invasion of Bohemia in 1757 represents the earliest evidence of modern operational art. Warfare in the eighteenth century primarily embodied limited war that flowed from limited resources and limited strategic ambition. During the Bohemian campaign, the Prussians transformed this paradigm and advanced the distinct traits of modern operational warfare. Frederick's campaign against Austria in Bohemia personifies the first rustling of modern operational art as defined by the criteria from the Military History Course.

ENDNOTES

The author paraphrased from the following references noted below, and includes a summary of the evidence cited in each reference.

1. U.S. Army, **Decisive Victory: America's Power Projection Army, A White Paper**, (Washington, D.C., October 1994), cover letter and pages 23 through 26. (Hereafter cited as **Decisive Victory**.) These pages contain GEN Sullivan's ideas for preparing tomorrow's Army. This reference cites the microprocessor as an elements of change, and its potential to alter warfare in the future.

2. GEN Gordon R. Sullivan and COL James M. Dubik, *Military Review*, "War in the Information Age." (Fort Leavenworth, Kansas: US Army Command and General Staff College, April, 1994), pages 46 through 62. This article discusses Toffler's Information Age and its impact on the conduct of warfare. More importantly, the article demonstrates the impact of Toffler's themes on guiding the Army leadership.

   GEN Frederick M. Franks, *Military Review*, "Full-Dimensional Operations: A Doctrine for an Era of Change," (Fort Leavenworth, Kansas: US Army Command and General Staff College, December, 1993), page 6. GEN Franks discusses the impact of "Third Wave" knowledge warfare that is changing the basic nature of warfare.

3. Alvin Toffler, **The Third Wave**, (New York, New York: Bantam Books, 1981), pages 9 and 14. (Hereafter cited as **Third Wave**.) These pages provide Toffler's themes of "social wave front analysis." He believes history is a "succession of rolling waves of change." These pages describe elements that make up and caused change for societies in his First Wave - agrarian and Second Wave - industrial.

   Alvin and Heidi Toffler, **War and Anti-War: Survival at the Dawn of the 21st Century**, (New York, New York: Little, Brown and Company, 1993), pages 1 through 5, 18 and 19, and 33 through 43. (Hereafter cited as **War and Anti-War**.) The authors restate and summarize the "wave" themes of the previously published **The Third Wave**.

4. **Third Wave**, pages 1 through 5 and 127 through 154. These pages provide Toffler's themes for his Third Wave. It is not until his **War and Anti-War** that he emphasizes information age.

   War and Anti-War, pages 1 through 5 and 64 through 80. The authors stress "knowledge" as information gathering and the basis for change in Third Wave society. They emphasize the importance of the microchip and computers to conduct Third Wave warfare.

5. David Jablonsky, *Parameters*, "US Military Doctrine and The Revolution in Military Affairs," (Carlisle Barracks, Pennsylvania: US Army War College, Autumn 1994), pages 18 through 36. COL(r) Jablonsky's article concerns a broad Revolution in Military Affairs (RMA) as a result of the interaction between technology and war. He cites Toffler's "wave" themes. His conclusions stress shorter decision times, and the spread of tactical and strategic decisions into the operational levels.

   Douglas A. MacGregor, *Parameters*, "Future Battle: The Merging Levels of War," (Carlisle Barracks, Pennsylvania: US Army War College, Winter 1992-93), pages 33 through 47. LTC MacGregor's article discusses "the technologically altered battlefield" that "merges the three levels of war."

   GEN Gordon R. Sullivan, Brief to SAMS, (Fort Leavenworth, Kansas: School of Advanced Military Studies, 141200 February 1995). While no transcript exists of this briefing, GEN Sullivan discussed the leadership skills of LTC Hugh Shelton during Operation RESTORE DEMOCRACY. GEN Sullivan explained a "new" pattern for the levels of war as a result of the Information Age.

   US Army, **FM 100-5, Operations**, (Washington, D.C.: US Government Printing Office, 1993), pages 1-3 and 6-1. (Hereafter cited as **Operations**.) These references provide the paraphrase for establishing the "echelons" of the levels of war, or a hierarchical pattern. The first paragraph of each page describes the levels of war and explains that they "flow" in echelons from highest to lowest.

6. **Operations**, page Glossary-8. This reference provided a direct quote for the definition of *Strategy*.

7. **Operations**, page 1-3. This reference provides a passage describing the levels of war within the text of the manual, and is paraphrased to further define *Strategy* as seeking "alliance or coalition objectives."

8. **Operations**, page 1-3. This sentence contains a direct quote of operation's "vital link" to *Strategy* and *Tactics*. Page 6-2 also contains the description of the *Operational* level being a "vital link."

9. **Operations**, page 6-2. A direct quote describing the *Operational* level of war.

10. **Operations**, pages 1-3, 6-3, and Glossary-8. These references describing tactics as "the art and science of employing available means to win battles and engagements" are paraphrased in this sentence. Additionally, page 6-3 explains the link to the *Operational* level.

11. Christopher Bassford, **Clausewitz in English: The Reception of Clausewitz in Britain and America, 1815-1945**, (Oxford, Great Britain: Oxford University Press, 1994), pages 18. Mr. Bassford outlines the differences in writing styles between Jomini and Clausewitz.

12. This table results from a class hand-out distributed by James J. Schneider for Theory Lesson 1-11, Battle. The author modified the operational level to include Jomini's Strategy and Grand Tactics.

Wallace P. Franz, "Two Letters on Strategy: Clausewitz' Contribution to the Operational Level of War," in **Clausewitz and Modern Strategy**, edited by Michael I Handel, (Totowa, New Jersey: Frank Cass and Company Limited, 1986), pages 172. Franz presents a table on this page similar to the monograph's that points out war = strategy, strategy = operations, and tactics = tactics in describing Clausewitz' definition in comparison to present doctrine defined in FM 100-5.

13. Baron de Jomini, **The Art of War**, translated by G.H. Mendel and W.P. Craighill, (Westport, Connecticut: Greenwood Press, 1862), pages 34 through 58. (Hereafter cited as **Art of War**.) These pages describe Jomini's five sub-divisions of *Military Policy*. The following passage from page 34 is a specific quote:

> *Indeed, in this class we may place the passions of the nation to be fought, their military system, their immediate means and their reserves, their financial resources, the attachment they bear to their government or their institutions, the character of the executive, the character and military abilities of the commanders of their armies, the influence of the cabinet councils or councils of war at the capital upon the operations, the system of war favor with their staff, the established force of the state and its armament, the military geography and statistics of the state which is to be invaded, and, finally, the resources and obstacles of every kind likely to be met with, all of which are included neither in diplomacy nor strategy.*

14. **Art of War**, pages 12, 13 and 34. On these pages Jomini defines *political objective* as the *object of the war*, which is determined by the statesman. Additionally, Jomini's *Military Policy* evolved from the *object of the war* similar to Clausewitz' *military objective*.

15. **Art of War**, pages 12, 13, and 61 through 64. These pages describe decisive points, bases of operations, lines of operations, and lines of communications, and reveal a resemble to the operational definitions in FM 100-5.

16. Carl von Clausewitz, **On War**, (edited and translated by Michael Howard and Peter Paret, (Princeton, New Jersey: Princeton University Press, 1976), page 89. (Hereafter cited as **On War**.) This page provides Clausewitz' description of the two trinities - primordial violence, hatred and enmity & the people, the military, and the government.

17. **On War**, page 87. This is a direct quote.

18. <u>On War</u>, pages 80 and 81. These pages describe the interaction of the political and military objectives in war.

19. <u>Art of War</u>, pages 59 through 64. These pages reveal the resemblance between Jomini's and FM 100-5's definitions of decisive points, bases of operations, lines of operations, and lines of communications. Additionally, *the one great principle underlying all operations* is condensed into a paraphrase of four maxims. This principle is:

1. To throw by strategic movements the mass of an army, successively, upon the decisive points of a theater of war, and also upon the communications of the enemy as much as possible without compromising one's own.

2. To maneuver to engage fractions of the hostile army with the bulk of one's forces.

3. On the battle-field, to throw the mass of the forces upon the decisive point, or upon that portion of the hostile line which it is of the first importance to overthrow.

4. To arrange that these masses shall not only be thrown upon the decisive point, but that they shall engage at the proper times and energy.

20. <u>Art of War</u>, page 162. This page contains the direct quote of Jomini's definition of Grand Tactics.

21. <u>Art of War</u>, pages 169 through 181. These pages describe the twelve *orders of battle* or formations to achieve concentration in combat, and the art of combining these formations in combat.

22.. <u>On War</u>, page 177. This page provides Clausewitz description of attempting to meet military objectives or war aims, and gives the direct quote of the relationship between engagements and strategy.

23. <u>On War</u>, pages 177, 178, 182, 194, 280, and 281. These pages concern Clausewitz description of strategy as sequencing space, mass, and time and their connection to the theater, the army and the campaign.

24. <u>On War</u>, pages 595 and 596. These pages provide Clausewitz definition of *center of gravity*, and the application of the factors of space, mass and time.

25. <u>On War</u>, page 193. This page gives Clausewitz' assertion that war is more than a science.

26. <u>Art of War</u>, pages 162 and 163. In these pages, Jomini places battle as an element of tactics, explains the three types of battles, and delineates the *aids* within the tactical level: courage, genius, and fortune.

27. <u>On War</u>, pages 137 through 140. This sentence paraphrases Clausewitz description of the three elements encompassing the character of war - moral factors, talent, and friction.

28. <u>On War</u>, page 227. This page provides the direct quote of Clausewitz' description of the engagement.

29. <u>On War</u>, pages 225 through 229. In these pages, Clausewitz clarifies tactics as consisting of engagements and battles, and describes these elements.

30. <u>Art of War</u>, pages 46 and 47. In these pages, Jomini explains the national leader, such as Frederick or Napoleon, taking command of his military, and conducting tactical levels operations. He indirectly explains that the national leader would be operating in all three levels of war.

31. <u>On War</u>, page 387. The italicized passage is a direct quote.

32. <u>On War</u>, pages 386 and 387. This analysis results from Clausewitz' theory that the tactical attack can influence political objectives. The italicized passage is a direct quote from page 386.

33. Robert A. Asprey, <u>Frederick the Great: The Magnificent Enigma</u>, (New York, New York: Ticknor & Fields, 1986), pages 434 to 443 and 472 and 473. The first set of pages explain the strategic objectives of the Prussians and her enemies, and the campaign/operational plans. The second set outline the tactical and strategic results of the battle of Rossbach.

Christopher Duffy, <u>The Military Life of Frederick the Great</u>, (New York, 1986), pages 109 through 111. (Hereafter cited as <u>The Military Life</u>.) These pages contribute the overall strategy and enemy objectives that faced the Prussians.

Christopher Duffy, "Rossbach," in Cyril Falls, editor, <u>Great Military Battles</u>, (London, 1964), pages 58 through 61. These pages present a brief examination of the Prussian Campaign of 1757.

Jay Luvaas, editor and translator, <u>Frederick the Great on the Art of War</u>, (New York, 1966), pages 213 through 216. (Hereafter cited as <u>Frederick on Art</u>.) This reference provided additional insight into the strategic setting.

*<u>NOTE</u>: The author asserts that the operational level of war began in 1757 with Frederick's invasion of Silesia, see the **Enclosure** for his evidence.*

34. <u>Art of War</u>, pages 46 and 47. These pages again describe Jomini's view of a the national leader taking an active role in the strategic, operational and tactical levels.

    <u>On War</u>, pages 386 and 387. These pages again represent Clausewitz' theory that the tactical attack can influence political objectives with Napoleon as an example.

35. David G. Chandler, <u>The Campaigns of Napoleon</u>, (New York, New York: MacMillan Publishing Company, Inc., 1966), pages 325 through 332. (Hereafter cited as <u>Campaigns</u>.) These pages describe the strategic goals of the principal nations forming the Third Coalition.

    Henry Kissinger, <u>Diplomacy</u>, (New York, New York: Simon & Schuster, 1994), pages 73 through 77. These pages detail the British diplomatic actions to form the Third Coalition and Britain's strategy during the Napoleonic Wars.

36. <u>Campaigns</u>, pages 325, 327, 331, and 332. These pages describe Napoleon's strategic goals.

37. <u>Campaigns</u>, page 331. This page relates the Coalition's military objective to remove "French forces and influence from Hanover, North Germany, Holland, Switzerland, North Italy, and Naples."

38. <u>Campaigns</u>, pages 382 and 383. These pages describe the Coalition's operational plan for three offensives and two defensives prior to Ulm. *NOTE: The spelling of Kutusov, or Kutuzov, depends on the source as some authors use the latter. This monograph uses the former spelling in Chandler's book.*

39. <u>Campaigns</u>, pages 404 and 405. These pages describe the allies change in operational plans after Ulm.

40. <u>Campaigns</u>, pages 387, 405, and 404 through 409. The first two pages detail Marshal Masena's operational objectives in northern Italy. The last set of pages discuss Napoleon's operational plan following Ulm. *NOTE: The author explains that successive engagements occurred between hostilities completing at Ulm and Austerlitz. Chief among these engagements are the actions of Marshal Murat's corps and its commander's blunder outside Vienna; fighting by Marshals Mortier's, Soult's and Lannes' corps, and Napoleon's attempt to encircle Kutusov at Hollabrunn.*

41. <u>Campaigns</u>, page 409. This page describes the operational situation Napoleon found his army in with Archduke Charles approaching the southern flank, "the northern flank equally imperiled," and the long precarious LOC.

42. <u>Campaigns</u>. page 409 and 410. These pages explain that Napoleon decided on seeking a tactical victory to escape the allies' operational trap.

43. <u>Campaigns</u>, pages 413 through 433. These pages describe the battlefield, the chronology, and the tactical plans of the Austerlitz fighting.

John Macdonald, <u>Great Battlefields of the World</u>, (New York, New York: MacMillan Publishing Company, 1984), pages 62 through 69. Mr. Macdonald lays out with computer graphics the tactical events on the Austerlitz battlefield.

44. <u>Campaigns</u>, pages 436 through 439 and 443 through 446. The first set of pages explain the strategic importance of Austerlitz on the French and Coalition. The second set describe the Prussian strategic political situation.

45. <u>War and Anti-War</u>. pages 38 through 40. Toffler spews out dates ranging from 1600 through 1875 as the early Industrial Age. Several of his characteristics for Industrial Age warfare are mass armies, weapon and equipment standardization, standing armies, war academies, and engines for transportation.

46. Gordon A. Craig, <u>The Battle of Koniggratz: Prussia's Victory Over Austria, 1866</u>, (Westport, Connecticut: Greenwood Press, Publishers, 1964), pages x and xi, 6 through 8, 18 through 22, and 30 and 31. These pages detail the new technologies featured at Koniggratz, and the use of railroads for mobilization. (Hereafter cited as <u>Koniggratz</u>.)

William McElwee, <u>The Art of War: Waterloo to Mons</u>, (Bloomington, Indiana: Indiana University Press, 1974), pages 106 through 110. The pages discuss the impact of the railroad on the Prussian General Staff.

<u>Modern World</u>, pages 169 through 171. These pages describe the Industrial Age technologies used at Koniggratz.

<u>Command in War</u>, pages 104 through 108. These pages explain the impact of the new technologies on the Prussian army.

47. <u>Diplomacy</u>, pages 78 through 85 and 104. These pages detail the terms of the Congress of Vienna, and discuss the central European balance of power between Prussia and Austria and France.

48. Trevor N. Dupuy, <u>A Genius for War: The German Army and General Staff, 1807 - 1945</u>, (London, Great Britain: MacDonald and Jane's, 1997), pages 75 through 77. These pages provide a concise time table for Bismarck's maneuvering to commence the Seven Weeks War over issues in Schleswig/Holstein.

<u>Koniggratz</u>, pages 2 through 4. These pages provide evidence of the rivalry between Prussia and Austria.

<u>Diplomacy</u>, pages 103 through 105 and 120 through 136. These pages provide an excellent account of Bismarck's vision for Prussia and his diplomatic

maneuvers against the Austrians and French to annul the balance of power created by the Congress of Vienna.

49. <u>Koniggratz</u>, page 29. This page explains the dangers of a protracted, two front war if the lesser German states join the Austrians.

A Genius for War, page 79. This page describes Bismarck's worry of Napoleon III entering the war.

The Art of War, pages 131 and 132. These pages detail the Prussian worry of France entering the conflict and protracting the war.

50. <u>Koniggratz</u>, pages 3 through 5. These pages explain the growing influence of Prussia, while Francis Joseph's quote is on page 5.

51. <u>Koniggratz</u>, page 5. This page describes Austrian attempts to negotiate with the lesser German states for assistance against Prussia.

52. Hajo Holborn, "Moltke and Schlieffen: The Prussian-German School," in **Makers of Modern Strategy: Military Thought from Machiavelli to Hitler**, edited by Edward Mead Earle, (Princeton, New Jersey: Princeton University Press, 1943), page 181. This page points out the Austrian options for their operational plan.

<u>Koniggratz</u>, pages 27 and 28, and 37 through 41. These pages describe the Austrian operational plans, and the problems with mobilization.

Command in War, pages 115 and 116. These additionally pages describe the Austrian operational plans.

53. <u>Koniggratz</u>, pages 26 through 31. These pages describe the Moltke's coordination with Bismarck and his operational planning beginning in 1860.

Command in War, pages 115 through 118. These pages additionally describe the Moltke's operational planning.

54. Walter Goerlitz, <u>History of the German General Staff: 1657 - 1945,</u> (Boulder, Colorado: Westview Press, 1985), pages 85 and 86. This pages explain Moltke's operational planning.

Hajo Holborn, "Moltke and Schlieffen: The Prussian-German School," in **Makers of Modern Strategy: Military Thought from Machiavelli to Hitler**, edited by Edward Mead Earle, (Princeton, New Jersey: Princeton University Press, 1943), pages 180 and 181. These pages point out Moltke's intention to concentrate the three main Prussian armies in the vicinity of Gitschin, and describes the Prussian commanders as not understanding the operational intention for a battle of encirclement at Koniggratz.

<u>Koniggratz</u>, pages 33 through 37. These pages explains Moltke's mobilization and operational plans, and the criticism they received.

<u>Command in War</u>, pages 115 through 118. These pages additionally describe the Moltke's operational planning.

<u>Genius for War</u>, pages 79 and 80. This pages additionally describe the Moltke's operational planning.

55. <u>Koniggratz</u>, pages 43 through 70. These pages describe the engagements and movements of the Prussian and Austrian armies leading up to the final climatic battle of Koniggratz.

<u>A Genius for War</u>, pages 80 and 82. These pages additionally describe the engagements and movements.

56. <u>Command in War</u>, page 104. This page provides Van Crevald's belief that Moltke was not a "master piece" of operational command, and his direct quote.

57. <u>Command in War</u>, page 104. This page provides Moltke's evaluation of his personal performance.

<u>Koniggratz</u>, pages 82 and 83. These pages provide Schlieffen's appraisal that the Prussian army commanders failed to understand Moltke's operational plan to encircle Benedek's army.

58. <u>Koniggratz</u>, pages 87 and 88. These pages describe the battlefield. Page 92 provides a map to estimate the distances involved in the battle.

59. <u>Koniggratz</u>, pages 88 through 93. These pages explain Benedek's tactical defense plan, and describe the difficulties he experienced control his forces prior to the battle.

60. <u>Koniggratz</u>, pages 83 through 86. These pages describe the Prussian tactical plan and its origination with 1st Prussian Army's concept for the next days engagement. Further, this account shows Moltke played little part in devising an operational plan. It was purely tactical.

<u>Command in War</u>, pages 135 and 136. These pages agree with Craig's account of the little part Moltke played in the scheme of maneuver for the battle on July 3, 1866.

<u>A Genius for War</u>, pages 84 and 85. These pages additionally describe the development of the tactical plan.

61. <u>Koniggratz</u>, pages 96 and 97 explain the beginning activities of the battle. Pages 139 through 144 detail the effects of 2nd Prussian Army seizing the Chlumm area. Page 160 describes the final shots fired as the battle ended.

62. <u>Koniggratz</u>, pages 167 through 172. These pages explain the immediate and eventual strategic changes caused by the battle.

Hajo Holborn, "Moltke and Schlieffen: The Prussian-German School," in **Makers of Modern Strategy: Military Thought from Machiavelli to Hitler**, edited by Edward Mead Earle, (Princeton, New Jersey: Princeton University Press, 1943), page 185. This page points out that the quickness of the tactic victory Napoleon III could have attempted to take the Rhineland and increase French influence with the German states.

The Art of War, page 139. This page explains that the Prussian victory dissuaded Napoleon III from attacking the German states.

63. **Koniggratz**, pages 167 through 172. These pages describe Bismarck's diplomatic maneuvering and the treaties and agreements as a result of the battle

A Genius for War, pages 86 and 88, and 89 through 93. These pages additionally describe Bismarck's diplomatic maneuvers.

History of the German General Staff, pages 88 and 89. These pages additionally describe Bismarck's diplomatic maneuvers.

64. Graf Helmuth von Moltke, **On the Art of War**, edited by Daniel J. Hughes, (Novato, California: Presidio Press, 1993), pages vii, viii, x, and 1 through 4. These pages explain the importance of Moltke in the development of military doctrine. (Hereafter cited as **Moltke on War**.)

Theodore Ropp, **War in the Modern World**, (New York, New York: Collier Books, 1959), pages 195 through 200. These pages describe the spread of the Prussian method of war throughout Europe. (Hereafter cited as **Modern World**.)

Martin Van Creveld, **Command in War**, (Cambridge, Massachusetts: Harvard University Press, 1985), pages 148 and 149. These pages point out the adoption of by most countries of the Prussian model for a General Staff system.

Koniggratz, pages 172 through 179. These pages detail the rise in prestige of the Prussian military.

65. **Moltke on War**, page 7. This page is paraphrased from the introduction by Daniel J. Hughes and points out Moltke's belief in the role of political and military advisers in time of war.

On War, page 31. This page is from the introduction by Michael Howard and additionally points out Moltke's views on political and military advisers in time of war.

66. **Moltke on War**, pages 12 through 14 and 45 through 47. These pages concern Moltke's belief that war is a system of expedients.

67. **Moltke on War**, page 36. This page provides Moltke's view on political considerations, and the italicized passage is a direct quote.

68. **Moltke on War**, page 7. This passage is a paraphrase of Moltke's role as military adviser in time of war.

On War, page 31. This page is paraphrased to again provide evidence of Moltke's views on military advisers in time of war.

Hajo Holborn, "Moltke and Schlieffen: The Prussian-German School," in **Makers of Modern Strategy: Military Thought from Machiavelli to Hitler**, edited by Edward Mead Earle, (Princeton, New Jersey: Princeton University Press, 1943), page 180. This page point out that Moltke's organization of command held a prominent place in his ideas on war.

Hew Strachan, **European Armies and the Conduct Of War**, (London, Great Britain: George Allen & Unwin, 1983), pages 88 through 104. These pages outline Moltke's departure from Clausewitz concerning political and military objectives, and the role of a Chief of Staff. (Hereafter cited as **European Armies**.)

Command in War, (Cambridge, Massachusetts: Harvard University Press, 1985), pages 140 through 147. These pages are Van Creveld's summary of his chapter on the Prussian "directed telescope," and explain the insertion of Moltke's staff between the strategic and tactical levels.

69. Correlli Barnett, **The Swordbearers: Supreme Command in the First World War**, (Bloomington, Indiana: Indiana University Press, 1963), pages 273 through 282. These pages concern the role of Bethmann-Hollweg, the Hindenburg-Ludendorff dictatorship, and the grand strategy conference of November 11, 1917. (Hereafter cited as **Swordbearers**.)

Gordon A. Craig, "Delbruck: The Military Historian," in **Makers of Modern Strategy from Machiavelli to the Nuclear Age**, edited by Peter Paret, (Princeton, New Jersey: Princeton University Press, 1986), pages 348 through 351. These pages discuss the problems Hans Delbruck identified with Hindenburg and Ludendorff's direction of the war and their lack of political concerns.

Gordon A. Craig, "The Political Leader as Strategist," in **Makers of Modern Strategy from Machiavelli to the Nuclear Age**, edited by Peter Paret, (Princeton, New Jersey: Princeton University Press, 1986), pages 482 through 485. (Hereafter cited as **Political Leader**.) These pages detail the rise of the Hindenburg-Ludendorff dictatorship and the fall of Bethmann-Hollweg and are paraphrased in this passage.

European Armies, pages 146 through 148. These pages describe the German strategic command's assertion that military objectives take precedence over political objectives.

70. **Political Leader**, pages 485 through 488. These pages discuss the workings of the British political and military leadership, and are paraphrased in this passage.

William Manchester, **The Last Lion: Winston Spencer Churchill, Visions of Glory, 1874 -1932**, (New York, New York: Little, Brown and Company, 1983), pages 604, 613, and 621. These pages details the Lloyd-George government and its relationship to the military and the public. This source provided evidence for the opinions of the London newspapers and the House of Commons.

71. Political Leader, pages 488 through 491. These pages discuss the workings of the French political and military leadership, particularly the influence of Clemenceau, and are paraphrased in this passage.

European Armies, pages 146 through 148. These pages describe the gradual reassertion of political control over French military command.

Modern World, page 270. This page discusses the failure of the French generals to adapt to tactical changes, and provides Clemenceau's famous quote - "war is too important to be left to the generals."

72. Edward M. Coffman, The War to End All Wars: The American Military Experience in World War II, (Madison, Wisconsin: The University of Wisconsin Press, 1986), pages 269 and 270, and 273 through 284. These first set of pages discuss Pershing's use of a corps staff for a diversion prior to the St. Mihiel offensive. The second set covers this offensive. In neither case does Pershing attempt to overly influence tactical events.

John J. Pershing, My Experiences in the World War, (New York, New York: Frederick A. Stokes Company, 1931), pages 225 through 275. These pages relate Pershing's actions during the first American offensive of the war. This attack is of particular note because Pershing needed to demonstrate American expertise for planning, operations and execution. If Pershing was to bypass the accepted chain of command through his corps commanders, this offensive would demonstrate that tendency. No evidence exists of that occurring during this operation in these pages.

William A. Stofft, Chief Historian, American Military History, (Washington, DC: U.S. Government Printing Office, 1989), pages 372 through 380, 388 and 389, 394 through 395, and 398 through 403. These pages detail the buildup of the army by Congress and President Wilson, the authority given to Pershing, Pershing's fight with the Allies for a American force, and Pershing leadership.

Russell F. Weigley, The American Way of War: A History of United States Military Strategy and Policy, (Bloomington, Indiana: Indiana University Press, 1973), pages 200 through 202. This source provided evidence of the establishment of the Army General Staff and the Elihu Root military reforms along the Prussian model.

73. American Military History, pages 407 through 409, 414 through 417, and 427 through 431. These pages describe the vertical hierarchy for the command system of the American military implemented by the 1920 Act.

The Joint Staff Officer's Guide, 1993, (Washington, D.C.: U.S. Government Printing Office, 1993) pages 1-9, 1-10, 2-7, and 2-8. These pages explain the development of the vertical hierarchy for the command system of the American Army and Joint Chiefs of Staff from the turn of the century until World War II.

74. Carroll V. Glines, The Doolittle Raid: America's Daring First Strike Against Japan, (New York, New York: Orion Books, 1988), pages 11 through 17. These pages outline the involvement of President Roosevelt, Admiral Ernest King,

USN; General "Hap" Arnold, USAAC; Captain Francis S. Low, USN; Captain Donald Duncan, USN; and Lieutenant Colonel James Doolittle, USAAC in the planning and execution of the raid. These military personnel demonstrate the vertical hierarchy of command for the raid. (hereafter cited as **The Doolittle Raid**.)

Lowell Thomas and Edward Jablonski, **Doolittle, A Biography**, (New York, New York: Da Capo Press, Inc., 1976), pages 157 through 161. These pages additionally describe the planning and development of the raid concept.

75. H. P. Willmott, **The Barrier and the Javelin: Japanese and Allied Pacific Strategies - February to June 1942**, (Annapolis, Maryland: Naval Institute Press, 1983), page 5. This page describes the origins of Japanese strategy that caused the beginning of war in the Pacific.

76. **The Barrier and the Javelin**, page 4. This page explains the origins of the Japanese plan of exhaustion.

77. **The Barrier and the Javelin**, page 5. This page provides reasons for both a defensive political and military objective.

78. **The Doolittle** Raid, pages 11 through 17. These pages discuss the political objectives of the Doolittle Raid and the military hierarchy that had input for the final operation.

79. **The Doolittle Raid**, pages 13 and 22 through 25. These pages explain the initial plan proposed by Captain Duncan, and present the memorandum outlining eventual Doolittle plan.

Doolittle, A Biography, pages 160 and 161. These pages additionally describe the eventual operational and tactical plans proposed by Doolittle.

80. **Doolittle, A Biography**, pages 184 and 185. These pages reproduce Doolittle's log for the engagement.

81. **The Doolittle Raid**, pages 57 and 58 and 69 through 72. These pages explain the Japanese home island defense system and their reactions during the Doolittle Raid.

82. **Doolittle, A Biography**, pages 184 and 185. Doolittle's log mentions a close round, but not much of an air defense threat during his flight over Japan.

83. **Doolittle, A Biography**, page 185. Doolittle's log records the time of flight and distance traveled.

84. **The Doolittle Raid**, pages 200 and 201. These pages describe the damage to the B-25s, and explain the Japanese and American reaction to the insignificant damage.

Doolittle, A Biography, pages 198 and 199, and 202 and 203. The first set of pages describe the extent of damage, the lost B-25s, and the reaction in Japan and the United States. The second set record Doolittle's reaction, who felt he did not deserve a Medal of Honor for losing the aircraft.

85. John Keegan, **The Price of Admiralty: The Evolution of Naval Warfare**, (New York, New York: Penguin Books, 1988), pages 214 and 215. These pages relate the shift in Japanese strategy and ultimately operations based on the tactical event of the Doolittle Raid.

The Barrier and the Javelin, pages 118 and 119. These pages additionally describe the shift in Japanese strategy and operations based on the tactical event of the Doolittle Raid.

86. **Age of Battles**, pages 167 through 170. This paraphrase concerns Weigley's description of the strategies employed during limited warfare, the size of armies, the threat to the monarchies, and parade ground tactics.

R.R. Palmer, "Frederick the Great, Guibert, Bulow; From Dynastic to National War," in Peter Paret, editor, **Makers of Modern Strategy from Machiavelli to the Nuclear Age**, (Princeton, New Jersey, 1986), pages 91 through 95. *After cited as* **Frederick**. This paraphrase points out the strategic objectives of limited war, and the parade style battle maneuver.

87. **Age of Battles**, pages 179 and 180. This reference furnished evidence to paraphrase the enemy and Prussian strategies during the Seven Years War.

Jay Luvaas, editor and translator, **Frederick the Great on the Art of War**, (New York, 1966), pages 213 through 216. *Hereafter cited as* **Frederick on Art**. This reference provided additional insight into the strategic setting.

Christopher Duffy, **The Military Life of Frederick the Great**, (New York, 1986), pages 109 through 111. *Hereafter cited as* **The Military Life**. This reference contributed to paraphrase the overall strategy and enemy objectives facing the Prussians.

Christopher Duffy, "Rossbach," in Cyril Falls, editor, **Great Military Battles**, (London, 1964), pages 58 through 61. This reference presented a brief examination of the Prussian Campaign of 1757.

B.H. Liddell Hart, **Strategy**, (New York, 1956), pages 108 and 109. This reference supplied a general overview of strategies of the participants in the Seven Years War. The primary focus is on Great Britain.

88. **Frederick on Art**, pages 215 and 216. This reference gave evidence for the disposition of Prussian forces against the Russians and Austrians.

Age of Battles, page 180. This reference furnished the evidence: "Two of the columns were to converge in the rear of Prague, while the other two would come under Frederick's immediate command for a direct assault on the capital.'"

The Military Life, pages 111 through 116. This reference contributed the Prussians operational plan.

89. The Military Life, pages 76 through 81. Duffy recounts the importance of Frederick's writings and Prussian drill.

Frederick, pages 99 through 103. This articles furnished evidence for Prussian tactics, Frederick's writings, and the "oblique order."

90. The Military Life, pages 112 and 113. This reference furnished the number of soldiers per force for the Prussians and the Austrians.

91. Age of Battles, page 180. This reference furnished the evidence: "Two of the columns were to converge in the rear of Prague, while the other two would come under Frederick's immediate command for a direct assault on the capital.'"

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